

I claim:

1. A method for the remediation of contaminated soil or groundwater at a pre-evaluated site, said method comprising the following steps:

determining an appropriate quantity of hydrogen peroxide to be used, an
5 appropriate number of injection point wells necessary for remediation, and
an appropriate amount of bacteria to be introduced at the site;

installing a plurality of injection points at the site;

establishing a maximum acceptance rate of water for each injection point;

introducing a hydrogen peroxide solution at each injection point;

10 maintaining the temperature in each injection point below 40 °C;

maintaining a rate of temperature increase in each injection point below 1 °C
change for every 5 minutes;

maintaining a liquid level in each injection point which is consistently
decreasing;

15 increasing the rate of introduction of the hydrogen peroxide solution to
maintain the injection point temperature below 40 °C, until the amount of
hydrogen peroxide used is between 60 per cent and 80 per cent of the
amount determined to be used for the site;

20 once the amount of hydrogen peroxide introduced into the injection points is
between 60 per cent and 80 per cent of the amount determined to be used for
the site, increase the rate of introduction of the hydrogen peroxide solution
to at least 75 per cent of the established maximum acceptance rate for each
injection point, maintaining the temperature at and around each injection
point between 25 °C and 70 °C for between 30 and 90 minutes;

terminating the introduction of hydrogen peroxide into the injection points when one of the following conditions occurs: (a) all of the hydrogen peroxide is used up; (b) injection point capacity is reached; or (c) injection point temperature is sustained between 50 °C and 70 °C;

5 flushing each of the injection points with water to reduce the temperature at each injection point below 45 °C;

introduction of bacterial nutrients into at least one of the injection points; and flushing the at least one of the injection points with water to distribute the bacterial nutrients.

10 2. The method of claim 1, further comprising:

introduction of bacteria into at least one of the injection points after the step of flushing each of the injection points with water to reduce the temperature at each injection point below 45 °C.

15 3. The method of claim 1, where the liquid level of each injection well is maintained by adjusting the rate of introduction of hydrogen peroxide solution into the injection well.

4. The method of claim 1, where the liquid level of each injection well is maintained by adjusting the rate of introduction of water into the injection well.

20 5. The method of claim 1, where the temperature at each injection point is maintained by the introduction of water.

6. The method of claim 1, where the rate of change of the temperature at each injection point is maintained by the introduction of water.

7. The method of claim 1, where the water introduced into the injection points is nutrient enriched water.

8. The method of claim 1, where the water used to flush the injection points is nutrient enriched water.

5 9. The method of claim 1, further comprising:

repeating the steps of the method over a period of several days, where an interval of at least 1 day separates each repetition.

10. The method of claim 1, further comprising:

10 repeating the steps of the method over a period of several days, where an interval of at least 1 week separates each repetition.

11. The method of claim 1, further comprising the step of:

15 prior to introducing the hydrogen peroxide solution into each injection point, measuring at least one of the following conditions at a plurality of locations at the site: baseline temperature, contaminant concentration, organic vapor, sulfate, iron, dissolved oxygen, pH, percent of the lower explosive limit, and existing bacteria concentration.

12. The method of claim 1, where the rate of introduction of the hydrogen peroxide solution into each injection point is between 5 per cent and 40 per cent of the established maximum acceptance rate for each injection point.

20 13. The method of claim 1, where the temperature at and around each injection point is sustained between 30 °C and 60 °C when the rate of introduction of the hydrogen peroxide solution into each injection point is at least 75 per cent of the established maximum acceptance rate for each injection point.

14. The method of claim 1, where the hydrogen peroxide solution is diluted with water.

15. The method of claim 14, where the water used to dilute the hydrogen peroxide solution is nutrient enriched water.